

REMARKS

In the present Amendment, Claim 1 has been amended to incorporate the subject matter of Claim 4 and to correct “silicone” to --silicon--. No new matter has been added, and entry of the Amendment is respectfully requested.

Upon entry of the Amendment, Claims 1-4 and 7-11 will be pending, of which Claims 4 and 8-11 are withdrawn from consideration.

In paragraph No. 2 of the Action, Claims 1-3 and 7 have been rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite.

The Examiner asserts that it is unclear how the porosity may be between 15% and 30% while the silicon is limited to 4 volume percent.

With due respect, the Examiner has misinterpreted the claims. Claim 1 recites that the content of the residual silicon is less than 4%, which is distinct from the silicon particles used to determine the porosity of the sintered body. Applicant notes that the paragraph bridging pages 21 and 22 of the specification indicates that “residual” silicon is silicon that is unreacted and is not removed from the silicon carbide sintered body. Accordingly, the claims are not indefinite for this reason.

Also, the “silicone” in Claim 1 has been corrected to --silicon--.

In view of the above, reconsideration and withdrawal of the § 112 rejection are respectfully requested.

In paragraph No. 4 of the Action, Claims 1-3 and 7 have been rejected under 35 U.S.C. §§ 102/103 as allegedly being anticipated by or rendered obvious by Odaka et al (WO 2000 07959).

Applicant submits that this rejection should be withdrawn because Odaka et al does not disclose or render obvious the presently claimed silicon carbide sintered body.

The Examiner contends that the sintered silicon carbide body in Odaka et al is formed by reacting elemental silicon with free carbon in the body. In view of the similarities in the process limitations, the Examiner reasons, the product would be expected to have similar silicon contents.

Applicant respectfully disagrees.

The present invention provides a silicon carbide sintered body with improved heat resistance and reliability, and a structure in which silicon particles can be uniformly dispersed. See, page 2 of the specification.

Claim 1 as amended recites:

A silicon carbide sintered body manufactured by a reaction sintering method comprising:
dispersing silicon carbide powder in a solvent, followed by pouring an obtained slurry-like powder mixture in a mold, further followed by drying to obtain a green body,
calcining the obtained green body under a vacuum atmosphere or an inert gas atmosphere at a temperature in the range of 1200°C to 1800°C to obtain a calcined body 1,
impregnating the obtained calcined body 1 with a carbon source,
calcining a calcined body 2 impregnated with a carbon source,

reaction sintering where the obtained calcined body 2 is impregnated with molten metallic silicon and free carbon in the calcined body 2 and silicon are reacted to obtain a silicon carbide body, and

heating in a vacuum atmosphere at a temperature in the range of 1450°C to 1700°C for 30 to 90 minutes to remove unreacted silicon,

wherein a porosity obtained from areas of silicon carbide particles and silicon particles in a sectional polished surface of the silicon carbide sintered body is greater than 15% and less than 30%, when the porosity (%) equals (the area of silicon particles/(the area of silicon particles + the area of silicon carbide particles)) x 100; a content of residual silicon is less than 4% to a total volume of the silicon carbide sintered body; a bending strength is greater than 200 Mpa; and silicon particles are uniformly dispersed.

Odaka et al disclose a fabrication method of a silicon carbide sintered body including a step of fabricating a silicon carbide powder, a step of fabricating a green body, a step of preliminarily baking the green body, and a step of filling pores in the green body by immersing the green body in high purity metallic silicon and reacting silicon sucked into the pores with free carbon in the green body. See, Example 3 of Odaka et al.

Odaka et al do not disclose "impregnating the obtained calcined body 1 with a carbon source, calcining a calcined body 2 impregnated with a carbon source, and heating in a vacuum atmosphere at a temperature in the range of 1450°C to 1700°C for 30 to 90 minutes to remove unreacted silicon" as recited in Claim 1 as amended.

Applicant discloses that when the processing temperature and time conditions in the step of removing the unreacted silicon are not satisfied, the exudation of silicon is observed and a silicon carbide sintered body having insufficient mechanical strength is obtained. See, Examples and Table 1 at page 32 of the specification.

Odaka et al does not teach or suggest the unexpectedly superior results provided by the present invention.

In view of the above, reconsideration and withdrawal of the rejection based on Odaka et al are respectfully requested.

Allowance is respectfully requested. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

Hui Chen Wauters
Hui C. Wauters
Registration No. 57,426

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

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